On the Impact of Distributed Technologies on Telecommunications Management

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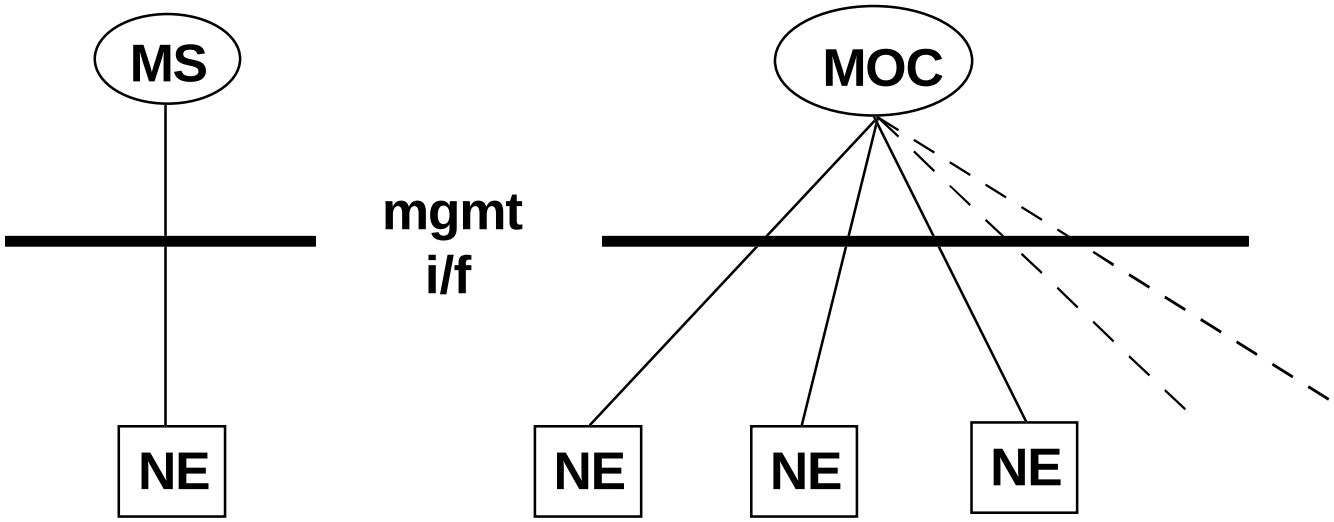
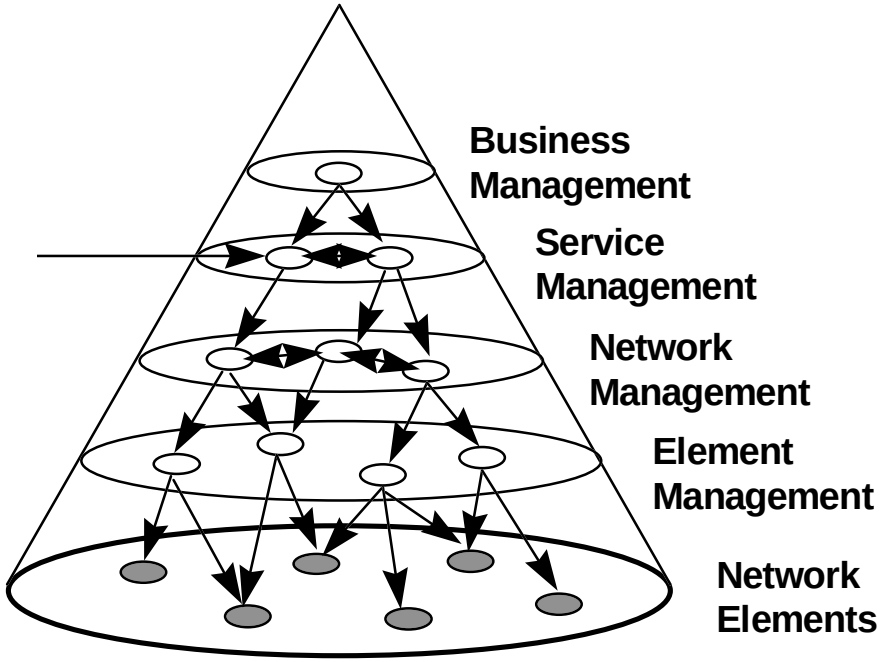
The Past: Proprietary, Centralised Management



MS: Management System
MOC: Management Operations Center
NE: Network Element

Present: the Telecommunications Management Network (TMN)

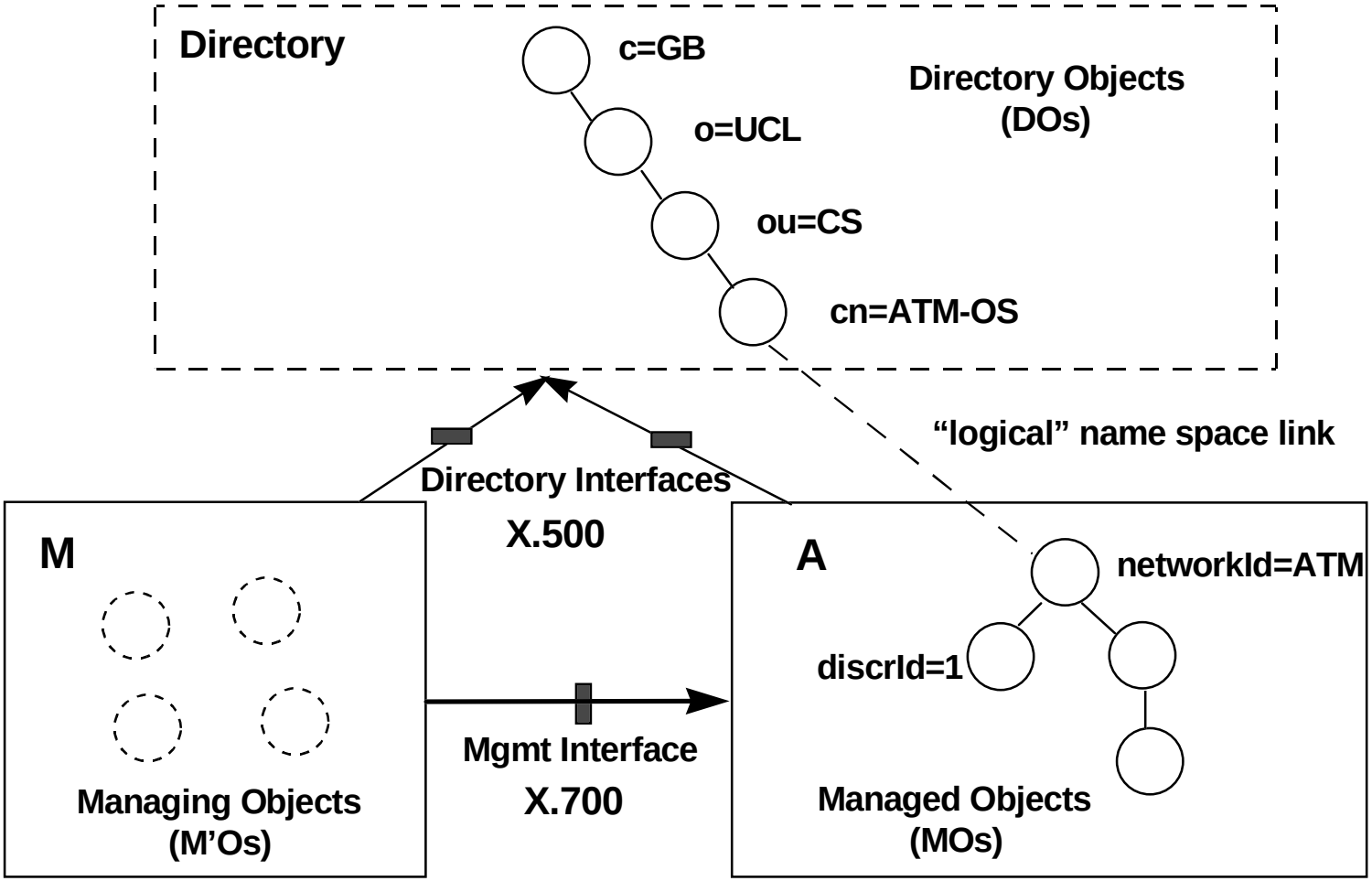
Open intra- (Q3) and inter-domain (X) interfaces



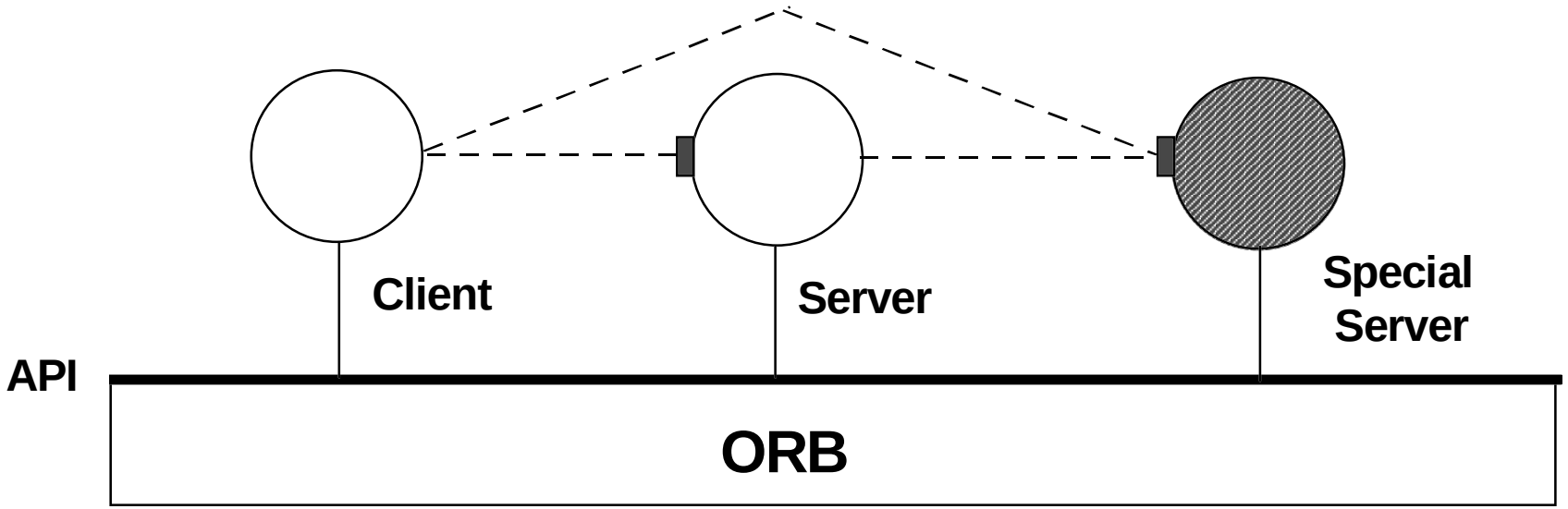
Fundamental Architectural Assumptions

- Separation of concerns through hierarchical abstraction
- Timely reaction to network events
- Minimisation of management traffic
- Scalability and globality
- The Operations System (or managed object “cluster”) the unit of distribution

The TMN Manager-Agent Model



The OMG CORBA Model



IDL Computational Interface and Object interaction

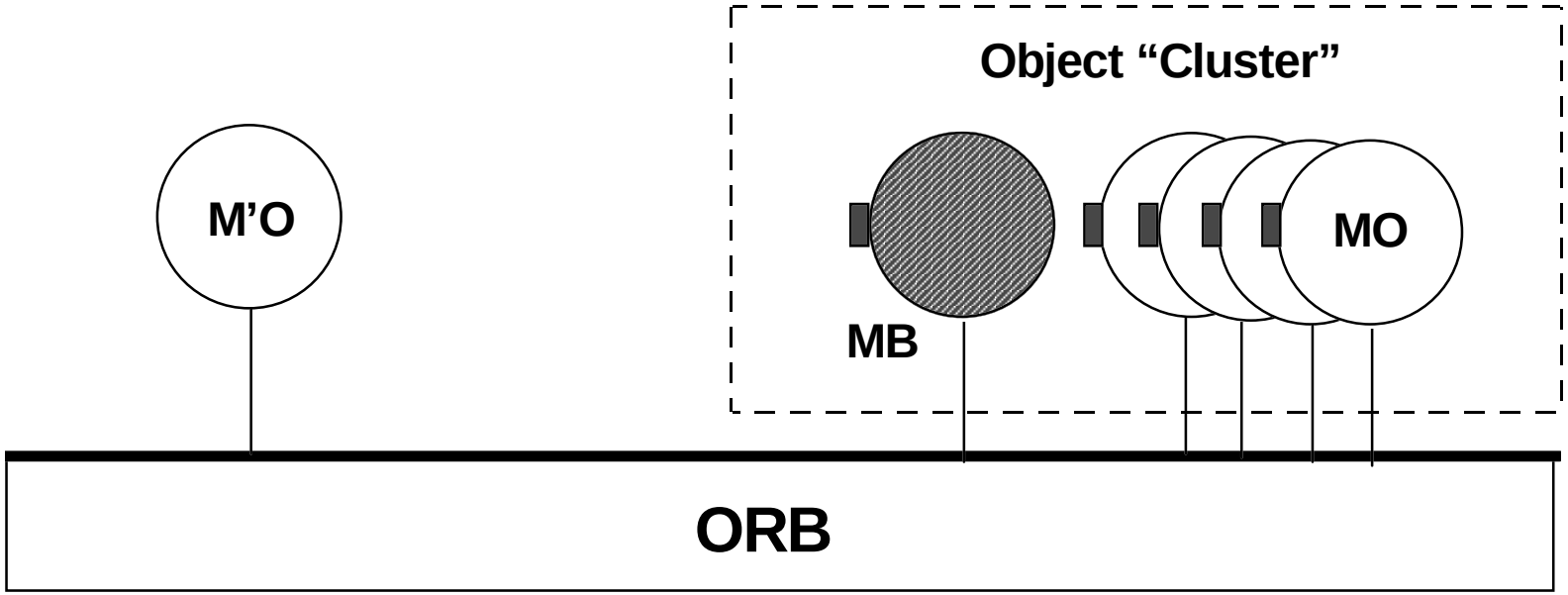
CORBA Advantages

- Portability due to standardised API, abstract interface & data structure model similar to O-O languages
- Different O-O language bindings (C++, Smalltalk, Java)
- Common object services (naming, event, relationship, lifecycle, trading etc.)
- ODP distribution transparencies:
  - access, location, persistence, transaction, security, resilience, replication, re-location, migration, ...

Necessary evolution to support TMN

- Universal federated naming
- Intelligent multiple object selection and access facilities (similar to OSI/TMN scoping/filtering + more)
- Fine-grain event mechanisms through filtering
- Event logging
- Facilities similar to the OSI System Management Functions:
  - metric monitoring, summarisation, accounting, testing, scheduling etc.

CORBA-based view of a TMN interface



M’O: Managing Object
MO: Managed Object
MB: Management Broker

Cultural difference: protocol stays the same (CORBA RPC), CMIS services are offered through special “brokers”

Distributed Technologies and TMN

- The TMN specification/design culture should be maintained over CORBA at present: essential to preserve investment
- ITU-T TMN interface specification groups should only use GDMO features compatible with IDL
- Dangers of adopting a distributed system base technology:
  - 1988-90: ANSA
  - 1992-93: OSF DCE/DME
  - 1994-96: OMG CORBA
  - 1998: MS DCOM, Java RMI (?)
  - 2000: ?????

Epilogue

- TMN addresses mostly *network* management
- Service operation & management mechanisms should be unified
- The TMN should be independent of the underlying base technology - CORBA may be just “this year’s model” :-)
- Protocols, brokers and platforms come and go but object specifications remain
- A sound object model is what we need in order to preserve investment